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GREAT LAKES FACT SHEET

How Much Habitat Is Enough?

Over the past two centuries of settlement and development in the Great Lakes basin, much of the original fish and wildlife habitat has been lost. The result is a fragmented landscape with smaller, isolated habitats. Some songbirds lack the interior woodland habitat necessary for successful breeding. Fish communities change as water temperatures increase through a lack of vegetated buffers along streams. Dabbling ducks and geese dependent on both wetland and adjacent upland habitat achieve minimal reproductive success due to predation.

Rehabilitation and protection efforts are now underway to reverse habitat loss. To guide these efforts, a document entitled **A FRAMEWORK FOR GUIDING HABITAT REHABILITATION IN GREAT LAKES AREAS OF CONCERN** has been prepared by Environment Canada's Canadian Wildlife Service and Great Lakes 2000 Cleanup Fund, the Ontario Ministry of Natural Resources and the Ontario Ministry of Environment. The goal of the *Framework*

is twofold: 1) to provide guidance to municipalities, conservation authorities, provincial and federal agencies, consultants, non-government organizations and individuals on how much habitat is needed to rehabilitate a natural, functioning ecosystem, and 2) to provide a method to identify priority locations for wetland, riparian and forest habitat rehabilitation and protection across a watershed or other landscape unit.



RECOVERING CORRIDORS IN A FRAGMENTED LANDSCAPE

The Remedial Action Plan Connection

In 1986, through the Great Lakes Water Quality Agreement, the United States and Canada agreed to clean up 43 locations across the Great Lakes basin known as Areas of Concern (AOCs), which have impairments such as contaminated sediments, eutrophication (excess nutrients), degraded fish and wildlife populations, and loss of fish and wildlife habitat. Over a decade later,

comprehensive documents known as Remedial Action Plans set out implementation strategies that are designed to lead to the rehabilitation of AOCs.

Considerable progress has been made in rehabilitating and protecting fish and wildlife habitat in these areas and elsewhere across the Great Lakes basin. The guidelines contained in the *Framework* were developed and tested in AOCs to help Remedial Action Plan teams determine when habitat has been rehabilitated to an acceptable level. Innovative fish and wildlife rehabilitation planning and implementation initiatives first conducted in AOCs are now finding widespread application in other jurisdictions across the Great Lakes basin and beyond.

by Marvin Heights Public School



CHILDREN ASSISTING WITH PLANTING

PUTTING THE FRAMEWORK TO WORK AT THE LOCAL LEVEL: LINKS TO MUNICIPAL LAND USE PLANNING

For Remedial Action Plan teams in AOCs around the Great Lakes basin, an important priority is rehabilitating degraded fish and wildlife habitat. The guidelines provided in the *Framework* are designed to assist in that pursuit. However, it needs to be emphasized that the protection of existing habitat must remain the most important activity in any natural heritage strategy.

In 1995, the government of Ontario implemented the Natural Heritage Policy under the Planning Act. The policy directs municipalities to identify and protect

natural heritage systems, including significant wetlands, woodlands, portions of the habitat of endangered and threatened species, fish habitat, valleylands, wildlife habitat, and Areas of Natural and Scientific Interest.

Once natural heritage systems have been identified across Ontario, it may become clear that many ecosystems are in need of rehabilitation, in addition to protection. The guidelines presented in the *Framework* can be used in at least two ways by municipalities and others:

1. Rehabilitation

The guidelines provide direction on amount, type and location of habitat rehabilitation to provide for the needs of fish and wildlife species and to ensure that ecological functions such as flood suppression and water quality will be improved.

2. Protection

The guidelines suggest that there are critical amounts of habitat below which sensitive species such as forest interior birds will not breed successfully, or wetland functions such as flood suppression will not occur. The scientific rationale for rehabilitation contained in the *Framework* can be used to protect important existing or

rehabilitated habitats (i.e., forest interior habitat, 200 hectare forest patches, and overall forest, riparian and wetland cover).

Additional benefits of this approach include:

- establishing priorities, enabling efficient use of limited funds;
- better targeted and coordinated community planting efforts;
- additional credibility for protection policies;
- linking rehabilitation and protection of habitat makes it easier to include rehabilitation efforts in official plan and zoning bylaw designations.



STREAM FENCING

In 1996, Wes Crown, Tay Township Director of Planning and Development, began working with the Severn Sound Remedial Action Plan team to map forest cover, vegetation along streams, and wetlands in the 59 square kilometre Hogg Creek watershed. Following the *Framework* approach, priority rehabilitation sites were identified throughout the Township. At the same

time, Tay Township was preparing a natural heritage system and updating its Official Plan. A number of priority rehabilitation sites were adjacent to significant valleylands, woodlands and groundwater discharge/recharge areas identified in the Official Plan. Many of these areas have

now been reforested through a tree planting program offered by the North Simcoe Private Land Stewardship Network. These newly rehabilitated habitats have been designated as Environmental Protection Priority One in the Township's draft Official Plan, meaning that no development can take place. For development proposed within 120 metres of a site, an environmental impact statement must be prepared. The next step will be to identify the rehabilitated sites as Environmental Protection in the Township's comprehensive zoning bylaw. As additional rehabilitation sites are reforested, they will be included in future updates of the Township's planning documents. By working together,

Protecting Rehabilitation Sites Through the Tay Township Official Plan in Simcoe County, Severn Sound Area of Concern

Tay Township, the Severn Sound Remedial Action Plan team, and the Stewardship Network provide an excellent example of integrating Great Lakes habitat rehabilitation initiatives and municipal planning land use protection policy.

HABITAT GUIDELINES

The guidelines presented here are based on scientific literature and field studies on the amount of habitat required to provide for the ecological needs of fish and wildlife in three types of habitat: wetlands, riparian areas and forested areas. Additional, equally important categories of habitat such as grassland, alvar and lake habitat warrant further investigation as the state of ecological knowledge develops.



WETLAND BIODIVERSITY

by John Mitchell

The recommended guidelines are intended as guidance to enable users to make decisions based on an understanding of local conditions. For example, current land use patterns may lead to setting initial habitat targets that are lower than the Framework's guidelines, with a long term commitment to improving habitat conditions in the decades ahead. In other cases, amounts of habitat may already be higher than the guidelines. In this circumstance, a review of habitat conditions originally on that landscape such as pre-settlement conditions obtained from surveyor's records, historical accounts, and soils mapping can be used to establish historically-appropriate targets. For example, if pre-settlement land base in a watershed was comprised of 60 per cent wetland cover, and the current amount of wetland is 15 per cent, the locally established target would be higher than the 10 per cent guideline suggested in the *Framework*.

Wetland Habitat Guidelines

WETLAND LOSS AND DEGRADATION HAS BEEN SIGNIFICANT, PARTICULARLY IN SOUTHERN ONTARIO. A HIGH PROPORTION OF GREAT LAKES FISH AND WILDLIFE SPECIES INHABIT WETLANDS DURING PART OF THEIR LIFE CYCLE, INCLUDING MANY SPECIES AT RISK, MAKING THEM CRITICAL HABITATS. WETLANDS ALSO PERFORM MANY WATER QUANTITY AND QUALITY IMPROVEMENT FUNCTIONS INCLUDING SHAVING OFF PEAK FLOWS AND IMPOUNDING WATER DURING STORM EVENTS TO REDUCE DOWNSTREAM FLOODING.

Ten per cent of a watershed, and six per cent of any subwatershed should be comprised of wetlands

Approximately 70 per cent of southern Ontario's original wetlands have been lost. Studies in the Great Lakes basin have shown that increasing

amounts of wetlands in a watershed result in reduced flooding and higher base flows, improving less dramatically once 10 per cent of a watershed is comprised of wetlands. At least six per cent wetland cover should be present in each subwatershed.



COASTAL WETLAND CREATION ON THE TORONTO WATERFRONT

Herbaceous or woody vegetation buffer of 240 metres around wetlands (particularly marshes)

The amount of adjacent natural vegetation is of particular importance to the ecology of wetlands. For small marshes, a ratio of 3:1 for upland to marsh habitat has been recommended. Narrow buffers of less than 30 metres may provide some water quality benefits to larger marshes, however greater widths are needed for significant

habitat gains. Studies have shown that most waterfowl nest within 240 metres of a marsh, while most turtles nest and hibernate within 275 metres of a marsh. Buffers can also provide hunting and nesting areas for area-dependent raptors such as Northern Harrier and Short-eared Owl that may nest in grasslands or marshes. Vegetated buffers are also important around other wetland types.

Rehabilitation activities should focus on swamp and marsh-type wetlands

There are four types of wetlands in the Great Lakes basin: marshes, swamps, bogs, and fens. Bogs and fens are rare habitats in the lower Great Lakes and are highly susceptible to changes in nutrient and water inputs, making them very difficult to rehabilitate once disturbed. The best management strategy for these types of wetlands is to protect them by securing their water sources and not altering their watersheds. Marshes are more readily restored due to their dynamic water and nutrient regime and related higher primary productivity. A newly-created marsh will see benefits within a year or two. It may be several years before a created swamp becomes partially functional, and a few decades before trees have had sufficient time to grow and improve the swamp's function.

Wetland rehabilitation should be strategically located in a watershed

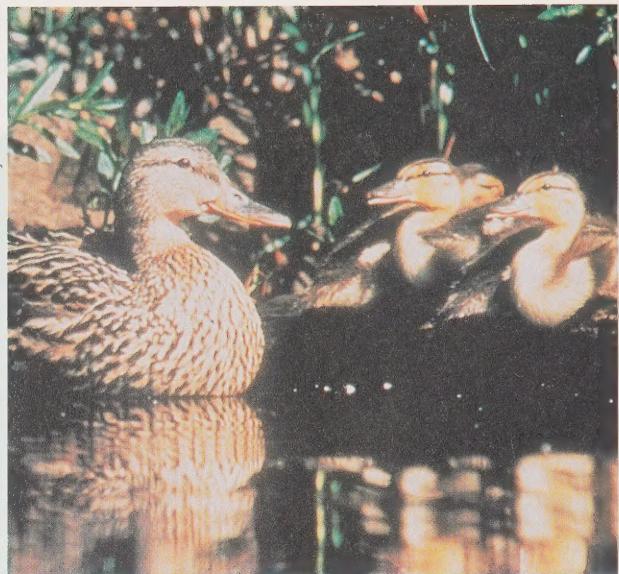
Wetlands are beneficial anywhere within a watershed but particular ecological functions can be met by restoring wetlands in key locations such as headwater areas to protect the sources of streams, groundwater recharge areas for maintaining stream flow and temperature, floodplains for flood attenuation and water storage, and coastal areas for fish production.

Swamps as large as possible; Marshes of various sizes

To maximize interior forest, swamps should be as large as possible. Marshes of various sizes attract different species and a range of sizes is beneficial across a landscape. Certain wetland species such as Black Tern, Forster's Tern and Short-eared Owl may require a marsh to be 20, 50 or 100 hectares in area, respectively, before they will make use of it for nesting.

Regularly-shaped swamps; Irregularly-shaped marshes

Swamps should be regularly shaped with minimum edge and maximum interior habitat. On the other hand, marshes thrive on interspersion, resulting from the irregular shape and maximum edge characteristics of functional marsh habitat.



MALLARD BROOD

All of the mapping that has been used in testing the *Framework's* guidelines has been digital, that is, designed to be used with a geographic information system (GIS). The choice of which base map to use depends upon the scale required for the project. In the case of larger landscapes such as the Niagara River AOC watershed (1 328.5 square kilometres), 1:50 000 national topographic database (NTDB) mapping was used as a base. This decision was made for two reasons: the unwieldy number of 1:10 000 Ontario Base Maps (OBMs) that would have been required for such a large area (over 100) was difficult to work with; and to satisfy an interest in seeing the complete region on one map for habitat comparison purposes. Once the entire AOC had been mapped using NTDB mapping, specific habitat rehabilitation opportunity areas were further mapped using OBM s. For smaller areas, such as the Humber River watershed in the

Toronto and Region AOC (908 square kilometres), OBM mapping was used right from the beginning. In the St. Lawrence River AOC, OBM mapping was used even though 84 map sheets were required. Many municipalities in Ontario have chosen OBM s as a base for planning purposes and will likely have made this choice already.

Forest, riparian and wetland cover were mapped using satellite imagery, air photos and soils maps. The choice of which remote sensing technology to use depends upon the accuracy required and the project budget. Satellite imagery to three metre resolution is now available, but is costly if a

large area is to be examined. Probably the best choice is to begin by examining the subject area using less expensive larger resolution imagery (i.e., 30 metre), and then focusing in on specific parts of an area with more accurate imagery. In the case of wetlands, finer resolution imagery is mandatory as interpretation mistakes such as labeling farmland as wetland have been made at larger resolutions. As the Ontario Ministry of Natural Resources enters into data sharing agreements with municipalities and additional higher resolution satellites are launched, many of the scale and cost questions are rapidly being answered. It is important to note that some form of ground truthing must be part of each project to avoid making planning decisions based solely on remotely sensed data.

What is Necessary for Measuring Habitat in Comparison to the Guidelines for Your Jurisdiction?

Riparian Habitat Guidelines

RIPARIAN REFERS TO ALL HABITAT WITHIN A STREAM CORRIDOR OR VALLEY, PARTICULARLY THE SHRUBS AND TREES ON THE STREAM BANK. RIPARIAN HABITATS PROVIDE IMPORTANT FISH AND WILDLIFE HABITATS, SUCH AS NATURAL LINKAGES BETWEEN DIFFERENT HABITAT FEATURES, MAKING THEM CRITICALLY IMPORTANT WILDLIFE MIGRATION CORRIDORS.

Seventy-five per cent of stream length naturally vegetated

Studies have shown that stream degradation occurs when riparian vegetation amounts to less than 75 per cent cover along streams. In particular, first to third order streams in headwater areas (coldwater or coolwater streams) with permeable soils benefit greatly from shading and leaf matter (which serves as food for benthic invertebrates) provided by adjacent overhanging vegetation. Streams of all orders benefit from being vegetated (even if the amount of vegetation is less than 75 per cent) as riparian vegetation maintains water temperatures, ensures bank stability, filters out excess nutrients and suspended solids, protects fish communities, and supports good water quality.

Thirty metre-wide stream buffers

Ideally, streams should have a 30 metre-wide, naturally vegetated buffer on both sides to reduce nutrients and sediments reaching the stream. When choosing a suitable stream buffer width for specific sites, take into account factors such as the nature of the watercourse (stream order and class), soil types, slopes, and adjacent uses. Buffer widths from three to 200 metres may be appropriate depending upon rehabilitation goals.

Total Suspended Sediment (TSS)

concentrations below 25 milligrams per litre

Suspended sediments may adversely affect aquatic habitat by filling in interstices of coarse substrate, thereby limiting habitats for aquatic invertebrates. Under extreme conditions fish eggs may be smothered, fish that feed by sight may have difficulty finding food, gills may become clogged, and disease may occur. Plant communities may be adversely affected by reduced light penetration into the water column (i.e., reductions in the extent of submergent vegetation). Maintaining TSS values below 25 milligrams per litre by implementing urban stormwater controls and rural non-point source best management practices should result in lower turbidity and fewer harmful effects on the stream and its biota.

Less than fifteen per cent of an urbanized watershed should be impervious

Less than 15 per cent imperviousness (hard surfaces) in an urbanized watershed should maintain stream water quality and quantity, and leave biodiversity relatively unimpaired. The goal should be to avoid extreme peak flows through incrementally minimizing hard surfaces, by making use of porous pavements and disconnecting roof downspouts.



BARREN RIPARIAN ZONE DUE TO CATTLE ACCESS



RESTORED RIPARIAN ZONE

Forest Habitat Guidelines

THE AMOUNT OF FOREST COVER, SIZE OF INDIVIDUAL FOREST PATCHES, FOREST TYPE, AND LINKAGES TO OTHER PATCHES IN A LANDSCAPE DETERMINE THEIR ABILITY TO SUPPORT WILDLIFE SPECIES WHICH DEPEND UPON THEM. THIS IS PARTICULARLY TRUE FOR MAMMALS AND FOREST INTERIOR BIRDS THAT REQUIRE EXTENSIVE FORESTS (NOTE THAT FOREST BIRDS ARE USED AS INDICATORS OF THE QUALITY OF THE FOREST BECAUSE THEY ARE EASILY SURVEYED AND MORE IS KNOWN ABOUT THEIR HABITAT REQUIREMENTS AND DISTRIBUTION THAN ANY OTHER GROUP OF WILDLIFE).

Thirty per cent forest cover

As the amount of forest habitat in an area declines, so does the number and per cent of expected forest bird species within the range (Table 1). In one study, statistical analysis was used to demonstrate that forest interior birds continued to increase in number to at least 35 per cent forest cover at a scale of 10 000 hectares; to approximately 24 per cent at a scale of 40 000 hectares; and, up to 20 per cent at a scale of 90 000 to 160 000 hectares. This analysis points out that the *Framework's* guidelines work best when they are fine-tuned for local variables, including the scale at which they are being applied.

large forest patches ranging in size from 140 to 201 hectares were surveyed in the Severn Sound AOC. From this work, it was determined that a single tract of 140 hectares was too small to support the regional forest bird community. At least one 200 hectare patch on a landscape unit should support over 80 per cent of expected forest bird species and several large tracts (i.e., greater than 200 hectares) are recommended to support 90 to 100 per cent of expected forest bird species.

Ten per cent of the watershed should be forest cover 100 metres or further from the forest edge; Five per cent of the watershed should be forest cover 200 metres or further from the forest edge

Studies have shown that certain bird species avoid forest edges in small, fragmented forests when breeding. Negative effects of small forests without 100 or 200 metre forest interior include increased predation and parasitism, desiccation by wind, insufficient food, and a higher susceptibility to catastrophic events such as fire, floods or human disturbances such as adjacent development. A minimum width of 500 metres is important in defining the ability of a forest to support forest interior bird species. Because true forest interior bird species tend to nest 200 metres from the edge, a forest width of 500 metres provides a 100 metre-wide band of habitat for these species.

Forest patches should be circular or square in shape

Square or circular habitats provide the greatest amounts of interior for species such as forest interior birds, while linear or irregularly-shaped habitats of similar size contain little or no interior. Forested areas with high interspersion and edge favour common generalist species as opposed to the more uncommon area-sensitive specialists.



COMMUNITY INVOLVEMENT IN Reforestation

At least one 200 hectare forest patch which is a minimum of 500 metres wide

A number of studies have demonstrated that the larger a forest habitat is, the more species it will support. A range of forest patch sizes have been suggested for different species. In one study four

Forest patches should be within two kilometres of one another

Studies have found that abundant forest cover within two kilometres of a particular forest patch is a significant predictor of the presence of forest interior bird species. Close proximity of forest patches also facilitates wildlife movement among them. When rehabilitating habitats, focusing on areas that are near other natural areas is most effective.



by John Mitchell

OAK SAVANNA FOREST

Corridors designed to facilitate species movement should be a minimum of 100 metres wide, and corridors designed for specialist species should be a minimum of 500 metres wide

Studies have demonstrated that wider corridors are more effective at facilitating species movement. Suitable habitat must be provided within the corridor for the target species that are expected to move along it. Vegetation composition in the corridor should be similar to that in the nodes that it is connecting, and the corridor should be continuous, maintaining a minimum width along its entire length (e.g., 100 metres wide along the entire corridor).

Watershed forest cover should be representative of the full diversity of forest types and ages found at that latitude

Although forest cover may be plentiful in a watershed, it may consist of early to mid-successional plant communities, mostly conifer plantations, or a variety of non-native species. Deciding which forest types are a priority for restoration requires some knowledge of the pre-settlement landscape as guidance.

TABLE 1. THE RELATIONSHIP BETWEEN FOREST COVER AND PER CENT OF FOREST BIRD SPECIES IN FIVE AREAS OF SOUTHERN ONTARIO (FROM: A FRAMEWORK FOR GUIDING HABITAT REHABILITATION IN GREAT LAKES AREAS OF CONCERN. ENVIRONMENT CANADA ET AL., 1998).

	Ottawa-Carleton	Haldimand-Norfolk	Waterloo and Wellington	Middlesex	Essex
Per cent Forest Cover (30 per cent guideline)	29.4	16.2	14.8/18.2	13.5	3.0
Per cent of Total Number of Forest Bird Species within Range Present	100.0	96.1	88.0	81.5	61.7
Per cent of FIE and FI Species within Range Present	100.0	93.9	84.4	82.0	54.5
Per cent of FI Species within Range Present	100.0	95.0	75.0	80.0	20.0

FIE = Forest Interior/Edge FI = Forest Interior

Explanation: Note that Ottawa-Carleton with approximately 30 per cent forest cover (guideline) has 100 per cent of forest birds expected, while Essex County with only three per cent forest cover has retained only 62 per cent of expected forest bird species. This relationship is more dramatic when the percentage of forest interior birds present is examined. Although it has only 16 per cent forest cover, Haldimand-Norfolk has retained 95 per cent of expected forest interior bird species - this is because the region has a number of large forest patches in close proximity, which relates to the guideline that states that forest patches should be within two kilometres of one another for maximum species richness.

CASE STUDIES: RESTORING CRITICAL HABITAT USING THE FRAMEWORK

During the development phase of the *Framework*, the approach was tested in ten AOCs. Remedial Action Plan teams in those areas established the current state of habitat through the use of remote sensing (i.e., satellite imagery, air photos), local knowledge and field checking. A geographic information system (GIS) was used to map and measure the current status of habitat against the *Framework's* guidelines and to direct on-the-ground habitat rehabilitation activities.

Welland River Fragile Land Reforestation Program, Niagara River Area of Concern

By Chris Attema, Niagara Peninsula Conservation Authority, Tel. (905) 227-1013 ext.245; Fax: (905) 227-2998.

The Niagara River Area of Concern includes the largely agricultural Welland River watershed and covers the central portion of the Niagara Peninsula from Mount Hope to Niagara Falls, an area of 1 328 square kilometres. Due to its large size, a 1:50 000 GIS database was constructed using land cover information from satellite imagery and other sources of information. Present habitat conditions were calculated and compared against the riparian and forest habitat guidelines.

For example, only 13 per cent of stream length is vegetated as compared to the guideline of 75 per cent,

and the AOC contains seven per cent wetlands as compared to the guideline of 10 per cent.

In the summer of 1997, the Niagara Peninsula Conservation Authority used the database to develop a targeted reforestation program. The key component was a landowner contact program which offered a compensation package. Landowners were offered up to \$1 235 per hectare as compensation for permanently retiring agricultural lands for riparian planting. Landowners 'bid' on how much money they required to participate in the program. Bids submitted by landowners were reviewed based on the compensation amount and the priority location of the project. One hundred per cent of the tree planting expense was covered through the program in addition to the compensation amount. Landowners were asked to sign an agreement recognizing the land as permanently retired from active agricultural production. Through the program, 18 hectares or eight kilometres of riparian lands in the Welland River watershed were retired and planted in 1997. The largest single riparian strip amounted to six hectares, while the average 'bid' amounted to \$891 per hectare. Stream buffer widths ranged from 20 to 50 metres.

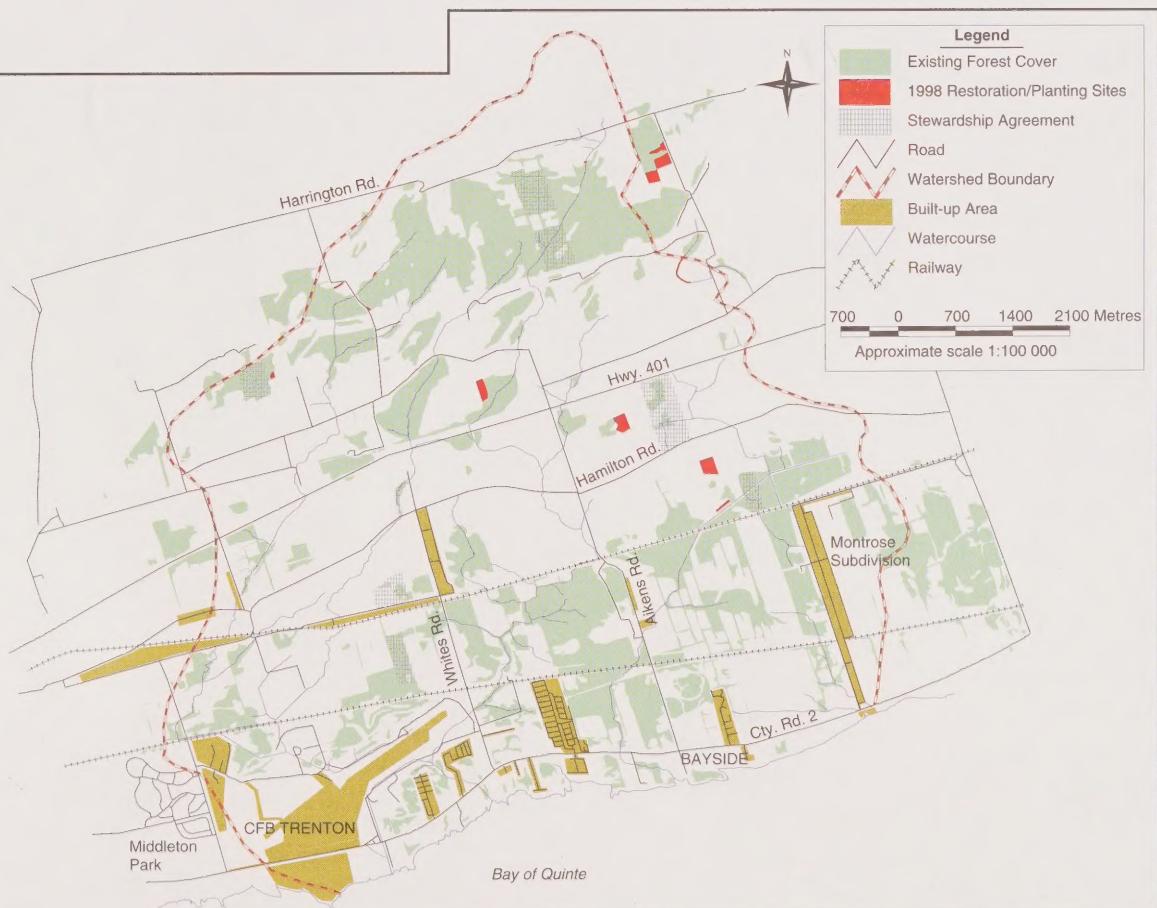


South Sidney and Wilton Creek Watershed Forest Cover Program, Bay of Quinte Area of Concern

By Barry Jones, Bay of Quinte Remedial Action Plan, Rural Water Quality Program, Tel. (613) 394-4829; Fax: (613) 394-5226

The five square kilometre South Sidney and 14 square kilometre Wilton Creek watersheds represent different types of land use in the expansive Bay of Quinte Area of Concern. Forest and riparian cover were mapped on a GIS database using 1:10 000 Ontario Base Mapping by Lower Trent Conservation. Conditions were calculated and compared to the riparian and forest habitat guidelines. For example, the urbanizing South Sidney watershed has 24 per cent forest cover, and 36 per cent stream length vegetated; and the predominantly agricultural Wilton Creek watershed has 27 per cent forest cover and 46 per cent stream length vegetated. This compares to the guidelines of 30 per cent forest cover and 75 per cent vegetated stream length.

Gaps in existing forest patches were identified and scrub lands surrounding forest patches highlighted as potential reforestation sites. Potential areas that could act as linkages between patches were also identified. A landowner contact program was developed and delivered through the Bay of Quinte AOC Rural Water Quality Program. Targeting was based on four categories: 1) plantable riparian lands adjacent to existing riparian woodlands; 2) plantable uplands adjacent to forest patches with interior habitat; 3) existing forest patches with interior habitat; and 4) existing riparian woodlands. Owners of plantable lands (categories 1 and 2) were compensated for 90 per cent of plant materials and planting costs. Farmers with cropland to be retired to plantings were compensated up to \$494 per hectare. Thirty-one thousand trees and shrubs covering 29 hectares were planted on 20 sites. Riparian lands amounting to 3.3 kilometres in length were naturalized through the program. Thirteen owners of category 3 and 4 lands covering 402 hectares, entered into informal handshake stewardship agreements to protect priority forest interior and riparian woodlands.



REFORESTATION TARGET AREAS IN THE SOUTH SIDNEY WATERSHED, BAY OF QUINTE AREA OF CONCERN

Humber River Watershed Reforestation Project, Toronto and Region Area of Concern

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The Toronto and Region Area of Concern is comprised of five major watersheds and a section of the coastline of Lake Ontario. At approximately 900 square kilometres, the Humber River watershed represents the largest watershed in the AOC. The watershed spans a range of landscapes from an essentially rural and forested headwaters to the highly urbanized lower reaches in Toronto. A 1:10 000 GIS database was constructed using satellite imagery, air photos and other data by the Toronto and Region Conservation Authority. Habitat conditions were calculated and compared against the riparian, wetland and forest habitat guidelines. For example, 35 per cent of stream

length in the Humber River watershed is vegetated, as compared to the guideline of 75 per cent. Fifteen per cent of the watershed is forested as compared to the guideline of 30 per cent. One per cent of the watershed is in wetland cover as compared to the guideline of 10 per cent.

The Toronto and Region Conservation Authority used forest cover mapping from the database to identify two large priority forest patches to expand forest interior habitat and to reforest riparian lands. By the end of 1998, 10.8 hectares of the 25 hectare planting site within the 161 hectare Glassco tract will be planted to expand breeding habitat for forest interior birds. The completed project will also provide a major east-west corridor for wildlife movement. In the spring of 1998, a 3.2 hectare planting at the 18 hectare Nashville planting site was completed to establish riparian forest and reforest former agricultural fields along the valley floor of the Humber River.

As these case studies show, benefits of using the *Framework* approach include:

- providing a guidelines-based framework which can be adapted to local conditions;
- introducing a standardized approach which can be used across the Great Lakes basin;
- basing 'how much habitat is enough?' decisions on current scientific knowledge;
- focusing limited financial and human resources on rehabilitating priority habitat locations;
- identifying the most ecologically significant locations for habitat rehabilitation and protection; and,
- linking natural heritage protection planning to rehabilitation planning by emphasizing the importance of protecting existing habitat critical to reaching local targets.

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The *Framework* will be available
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Ontario Green Lane at:
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